Draft 2016 Water Quality Assessment and Impaired Waters Integrated Report

August 24, 2017

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Water Monitoring and Assessment Program




Purpose

- Provide general information and highlights from the draft 2016 Integrated Report (IR)
- Increase public awareness of water quality in the Commonwealth
- Answer questions related to the 2016 IR
  - Public comment period ends on **September 6, 2017**

Background – What is the IR?

The Water Quality Assessment Integrated Report, or IR, describes the extensive efforts to monitor, assess, and improve water quality in the waters of the Commonwealth

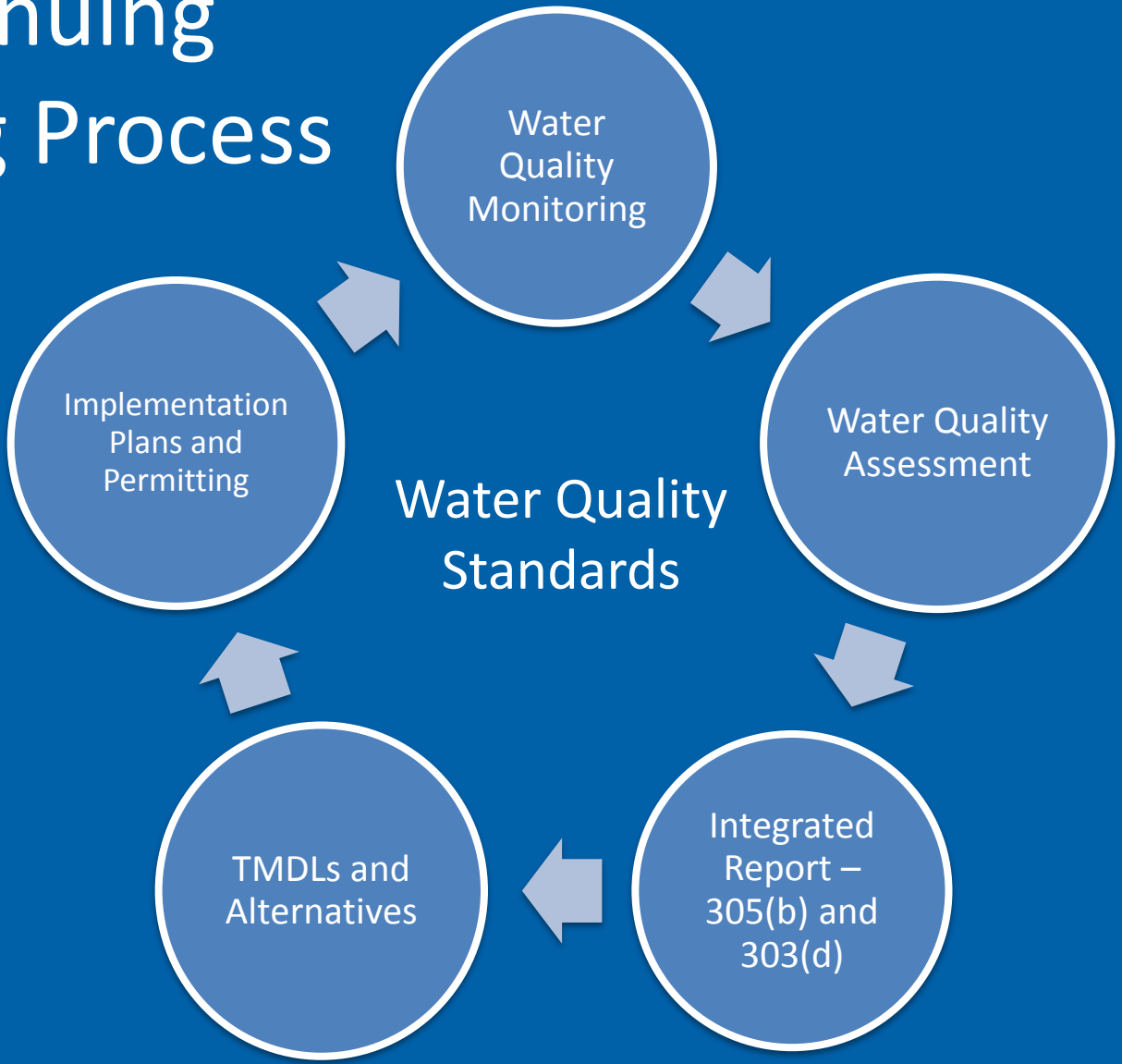
The IR

- Provides descriptions of water quality programs, and summary reports on water quality conditions
- includes a list of waters that are considered impaired (303(d) list)
- describes water quality restoration efforts (TMDLs, Implementation, delists)

Background – Key Factors

- The Clean Water Act and Virginia Water Quality Monitoring, Information and Restoration Act require DEQ to assess and report on the quality of state waters every even-numbered year
- Six Year Assessment Period: Jan. 2009 – Dec. 2014
- Assessments are conducted in reference to Virginia Water Quality Standards as of January 2011
- Water quality data was evaluated for multiple samples collected by DEQ at 4,205 stations
- Data from over 900 non-agency stations and over 1,600 citizen monitoring stations were submitted for use in the assessment

Continuing Planning Process

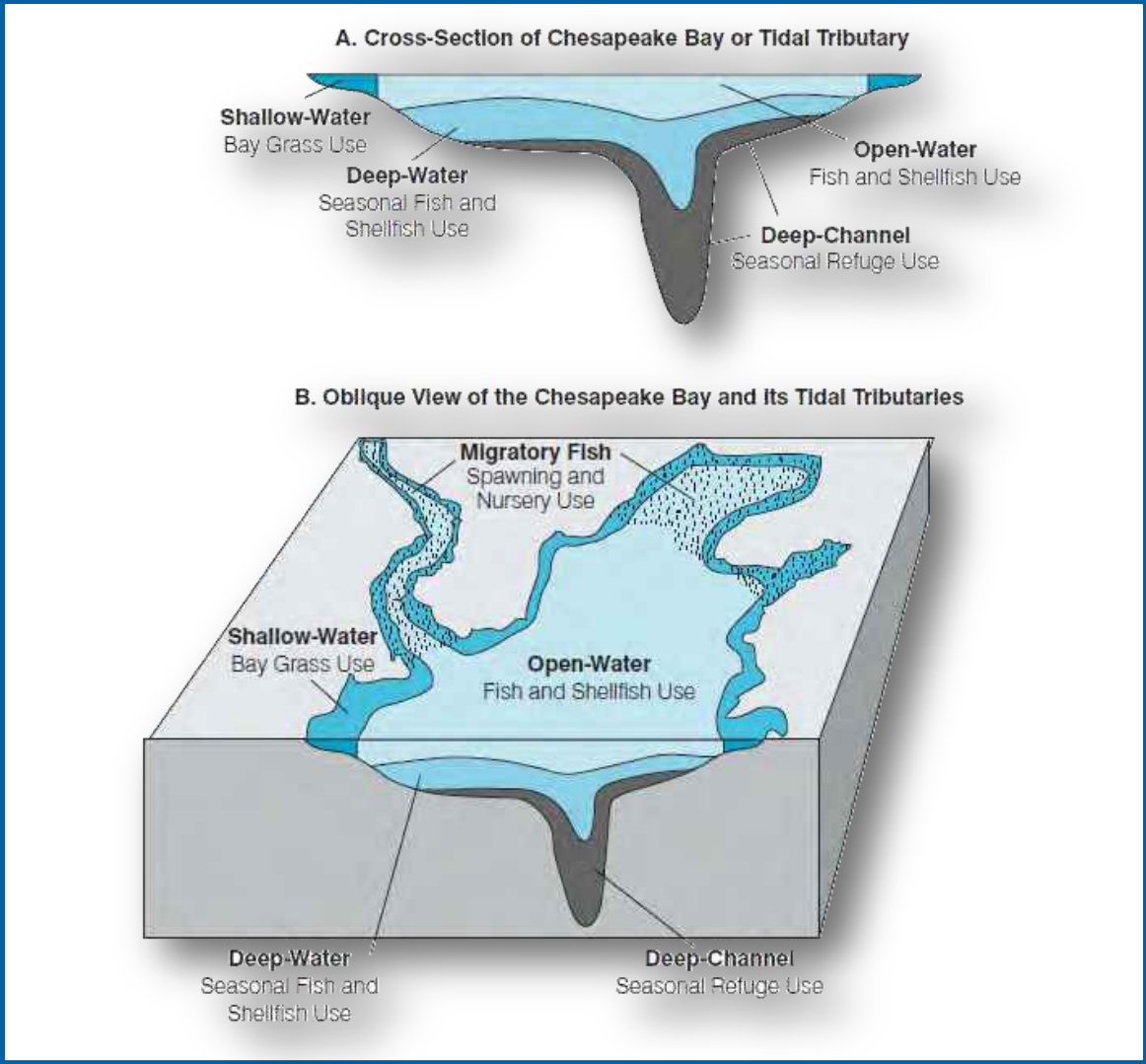


Water Quality Standards - Designated Uses

DESIGNATED USE	USE DESCRIPTION AND INDICATORS
Recreation (Swimming) Use	**Description**: Swimming, boating, and other recreational activities
	Indicators: Bacteria levels, VDH notices
Public Water Supply Use	**Description**: At the drinking water intake and within a 5-mile protection area, criteria protect human health
	Indicators: Water column toxics, VDH notices
Wildlife Use	**Description**: The propagation, growth, and protection of associated wildlife
	Indicators: Water column toxics

DESIGNATED USE	USE DESCRIPTION AND INDICATORS
Shellfishing Use	**Description**: Marketable shellfish (clams, oysters, mussels) that are safe for human health
	Indicator: VDH notices
Fish Consumption Use	**Description**: Game and marketable fish species that are safe for human health
	Indicators: VDH notices, fish tissue toxics, water column toxics
Aquatic Life Use, Chesapeake Bay sub-uses	**Description**: The propagation, growth, and protection of a balanced native population of aquatic life that may be expected to inhabit a waterbody
	Indicators: Dissolved oxygen, pH, temperature, water column and sediment toxics, toxicity tests, benthics, submerged aquatic vegetation, chlorophyll a* and total phosphorus*

Ches. Bay & Tidal Tributaries Refined Designated Uses



Water Quality Monitoring

Fixed or conventional monitoring programs

- Consistent, scientifically defensible information on important chemical, physical, and biological characteristics of surface water resources
- Useful for describing and quantifying water quality impacts and improvements, developing long-term trends at specific sites, monitoring for regulatory compliance, supporting TMDL and Implementation efforts
- Sites typically located on or at the mouths of large tributaries and bridge crossings
- Includes the following Monitoring Programs:
  - Ambient network
  - Chesapeake Bay network
  - Biological monitoring
  - TMDL and post Implementation monitoring
  - Ambient trend network
  - Reservoir monitoring
  - Fish Tissue Monitoring
  - Special Studies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Water Quality Monitoring

Freshwater and Estuarine Probabilistic Monitoring

- Uses data from randomly selected stations to provide an unbiased, statistically sound characterization of ambient conditions
- Site design includes low-order streams in addition to large-order waters
- Prob mon data has many uses…
  - broad regional assessments of overall ambient conditions,
  - to establish baseline water quality conditions,
  - answer questions about statewide and regional water quality conditions,
  - and to identify problem areas for follow-up monitoring

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Citizen Monitoring Spotlight

- 2016 IR marks the highest ever number of total citizen stations sampled, as well as the highest number of Level III citizen volunteer stations included in a formal assessment
- Citizen Monitoring Fact Sheet
  http://www.deq.virginia.gov/Portals/0/DEQ/Water/WaterQualityMonitoring/CitizenMonitoring/Cit_Mon_Final.pdf
- Citizen Monitoring Grant Opportunity (applications due August 31, 2017)
  http://www.deq.virginia.gov/Programs/Water/WaterQualityInformationTMDLs/WaterQualityMonitoring/CitizenMonitoring/GrantOpportunities.aspx
- Citizen Nominated Monitoring Map Story
  http://vadeq.maps.arcgis.com/apps/Cascade/index.html?appid=253fd23472284c2c840a1bad262e57e2

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Water Quality Assessment

- Analyze water quality data and compare the results to Water Quality Standards and other appropriate criteria and guidelines

  http://www.deq.virginia.gov/Programs/Water/WaterQualityInformationTMDLs/WaterQualityStandards/Criteria.aspx

- Follow the assessment procedures and methods outlined in Virginia's Water Quality Assessment Guidance Manual

  http://www.deq.virginia.gov/Programs/Water/WaterQualityInformationTMDLs/WaterQualityAssessments/2016WQAGuidanceManual.aspx

- Determine the extent to which Virginia's waters are supporting the Designated Uses

Assessment Categories

- EPA's Integrated Reporting Guidance identifies the following assessment categories:

  1 = Water Quality Fully Supports All Designated Uses

  2 = Water Quality Fully Supports All Uses Assessed

  3 = Insufficient Data to make Assessment

  4 = Impaired (No TMDL Needed)

  5 = Impaired (TMDL May Be Needed)

- Virginia added additional Subcategories in 2006 to help track TMDL implementation

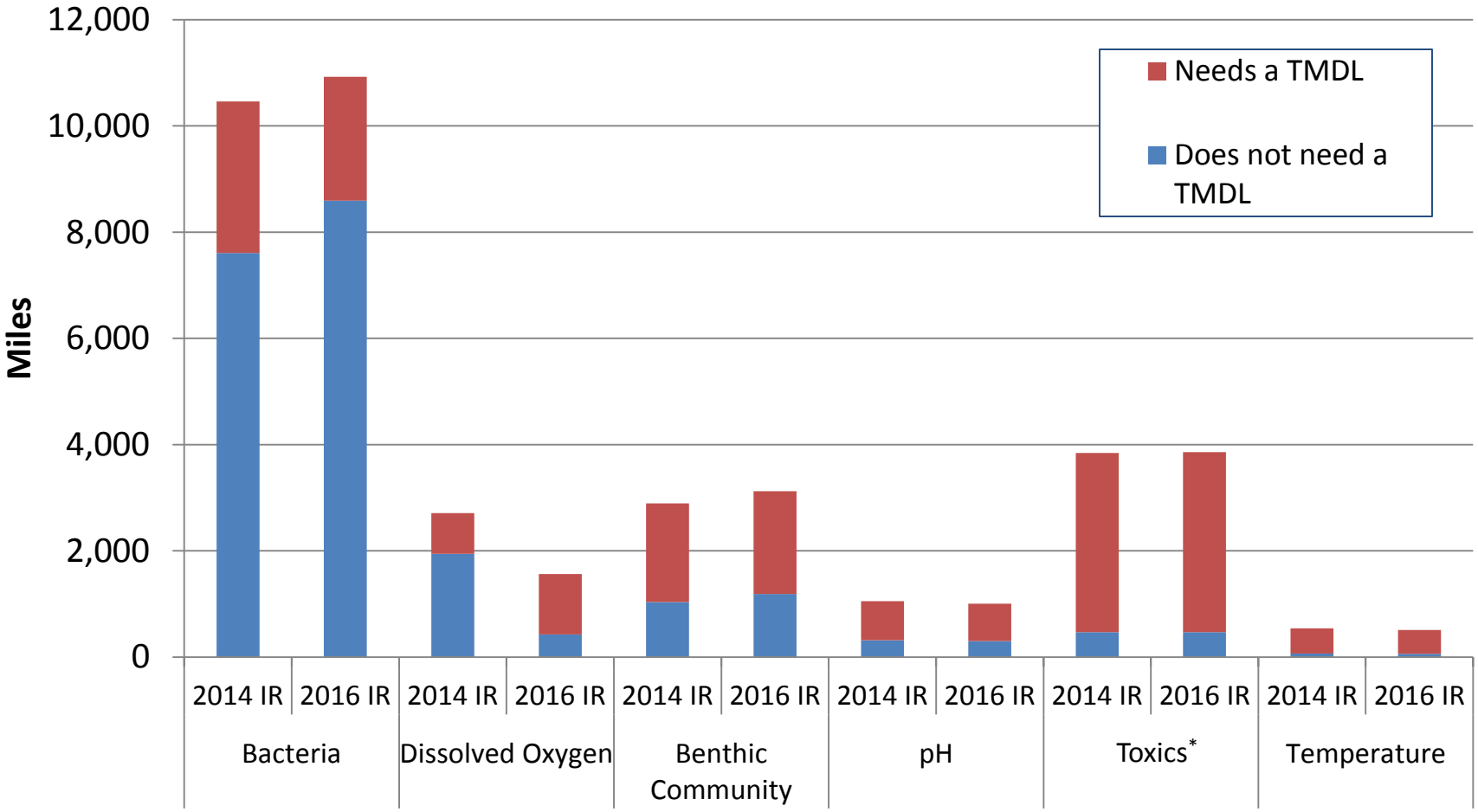
2016 Assessment Overview

Improvements since the 2014 IR, shown as percent change, are in **green** font

	Rivers (mi)	Lakes (acres)	Estuaries (sq mi)
Impaired (% total)	15,713 (16%)	93,508 (80%)	2,132 (75%)
Percent change from 2014	0.2%	**-1.3%**	**-0.2%**
Non-Impaired (% total)	7,177 (7%)	20,318 (17%)	315 (11%)
Percent change from 2014	**10.2%**	**4.2%**	**1.6%**
Not Assessed (% total)	78,086 (77%)	3,373 (3%)	400 (14%)
Percent change from 2014	**-0.9%**	12.0%*	2.5%
TOTAL	100,976	117,200	2,848

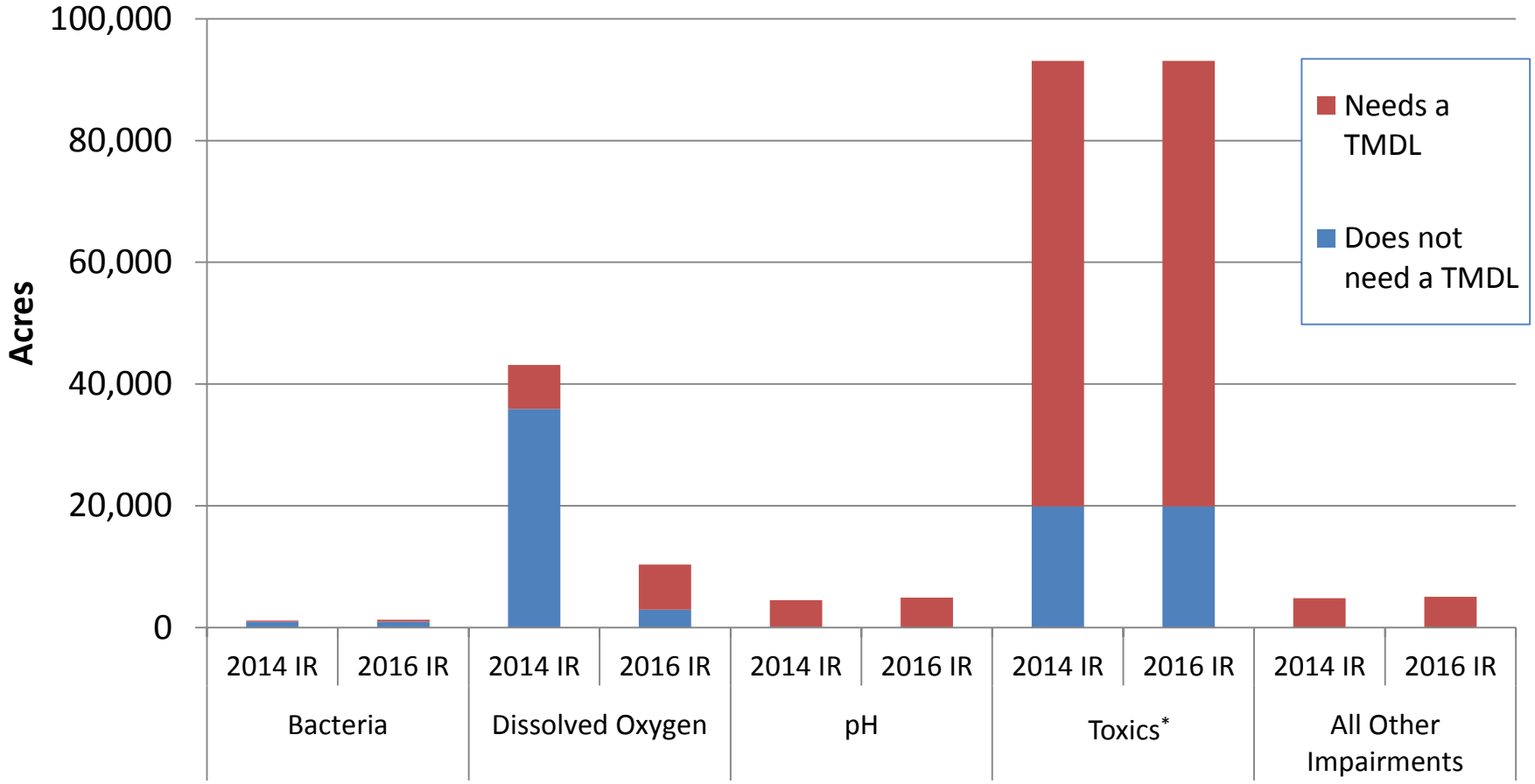
*Includes waterbodies that have been previously assessed but don't have data in the current assessment window. Some of these waters will be reviewed during the 2018 assessment period.

Summary of Impaired Rivers



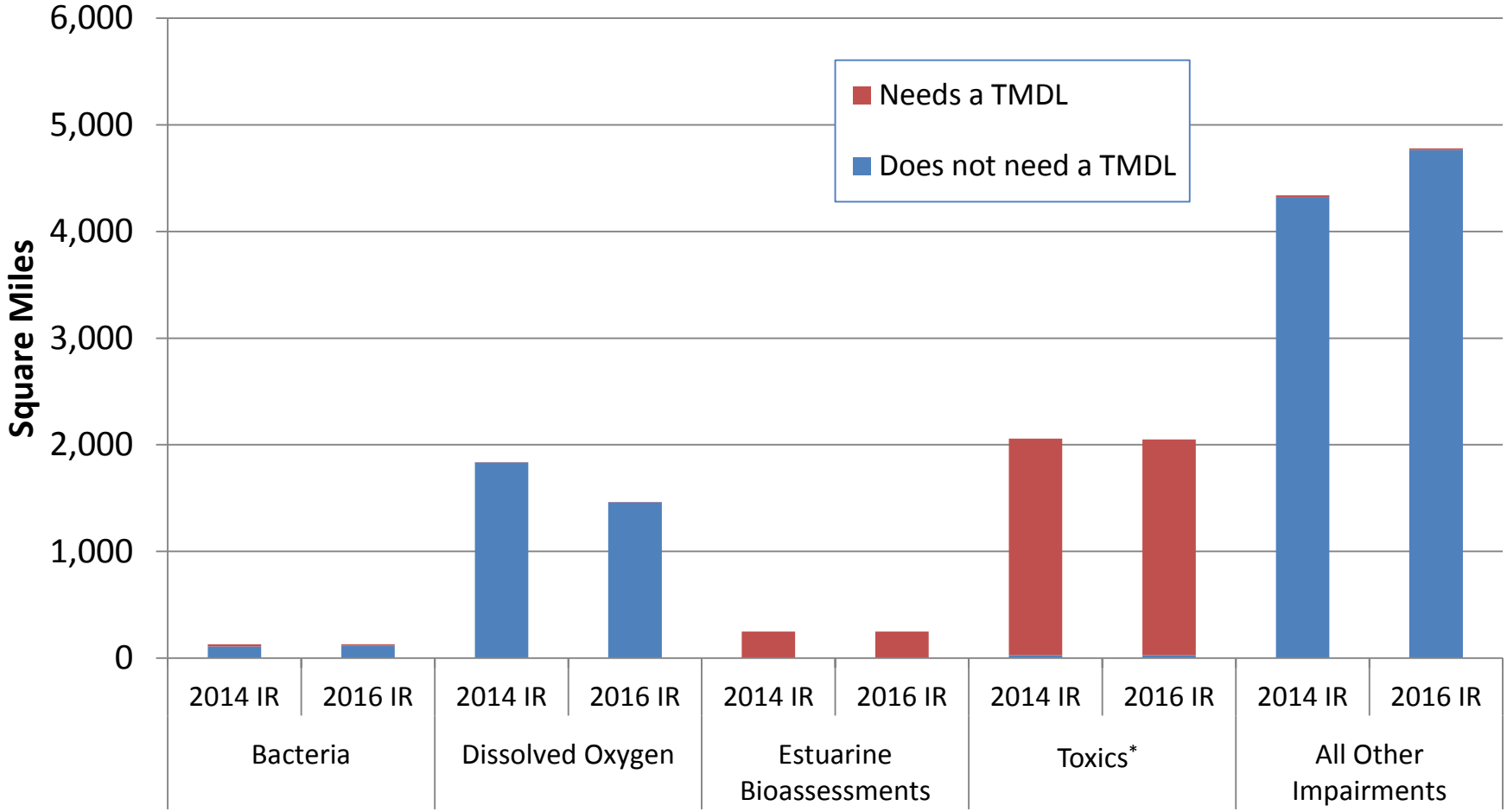
* The overwhelming majority of toxics impairments in rivers, lakes and estuaries are due to exceedances of thresholds for PCBs and Mercury in fish tissue.

Summary of Impaired Lakes



* The overwhelming majority of toxics impairments in rivers, lakes and estuaries are due to exceedances of thresholds for PCBs and Mercury in fish tissue.

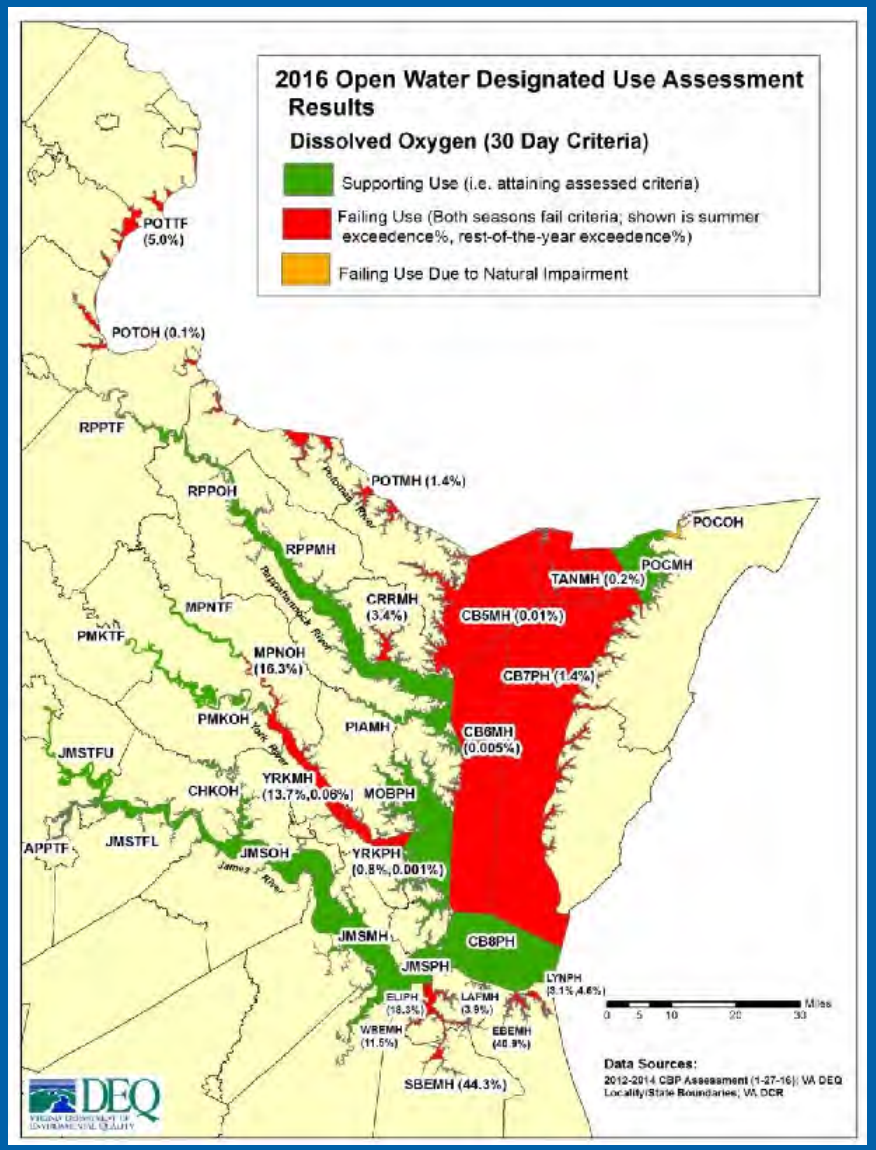
Summary of Impaired Estuaries



* The overwhelming majority of toxics impairments in rivers, lakes and estuaries are due to exceedances of thresholds for PCBs and Mercury in fish tissue.

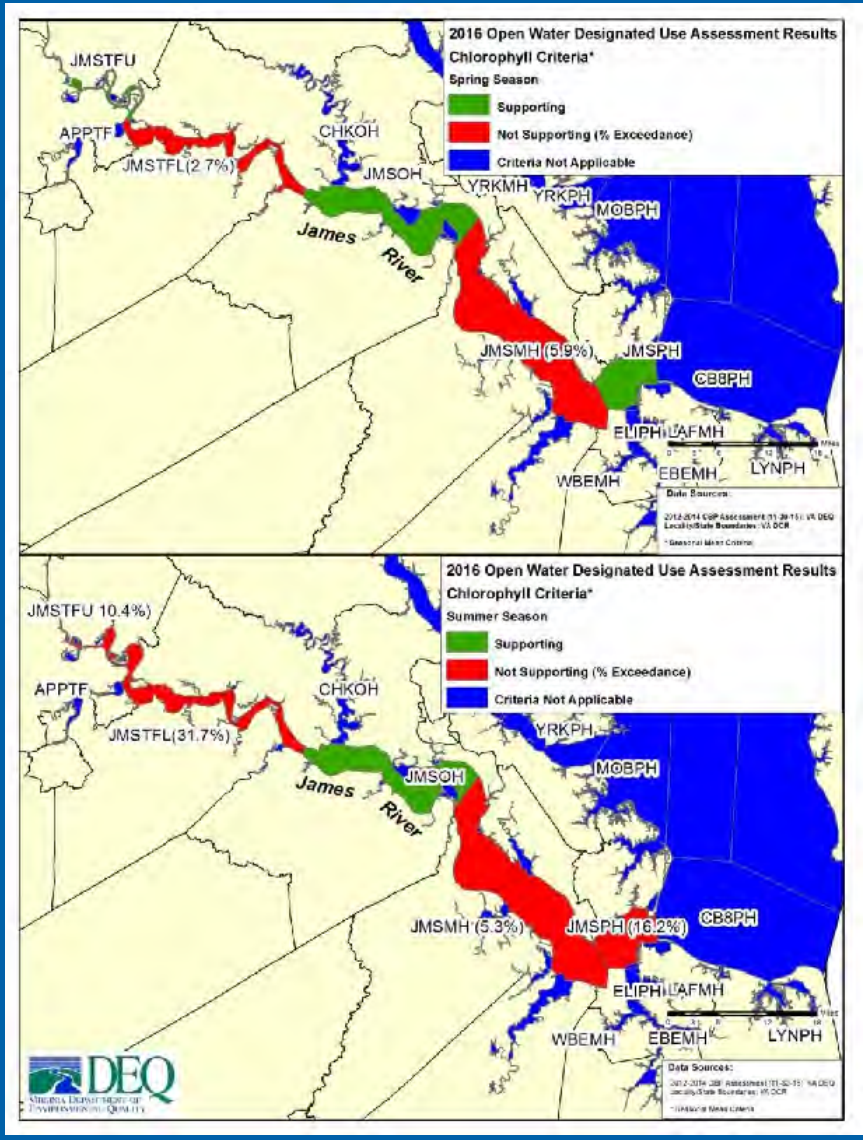
Chesapeake Bay and Tidal Tributaries - Highlights

- Hypoxia continues to be an issue in most of the Bay
- Improvements seen in the James and Rappahannock



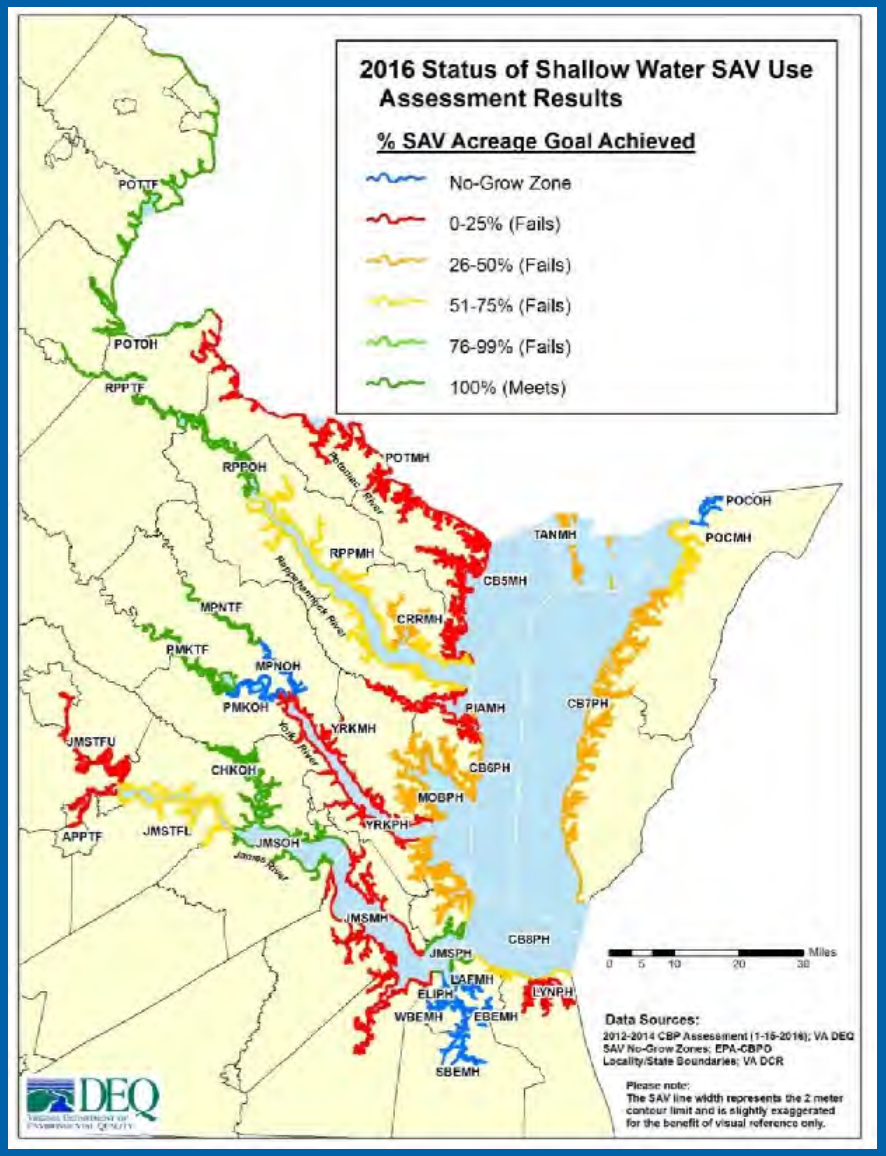
Chesapeake Bay and Tidal Tributaries - Highlights

- Numeric Chlorophyll criteria only apply to the James River
- Criteria were attained in the middle James



Chesapeake Bay and Tidal Tributaries - Highlights

- 47% of SAV restoration goal met (target is 77,463 acres)
- Full attainment of SAV use found in parts of each major tidal tributary, except Eastern Shore

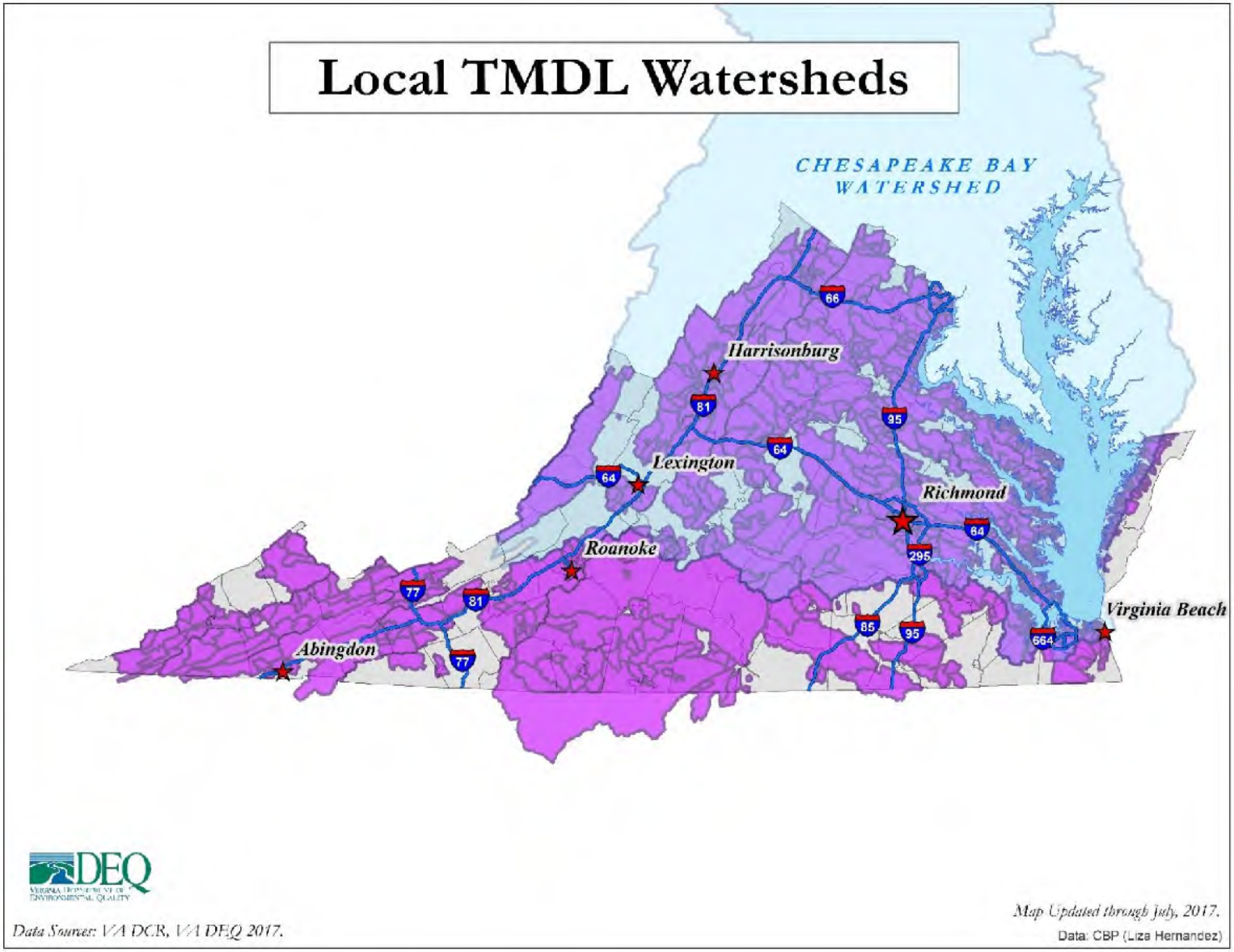


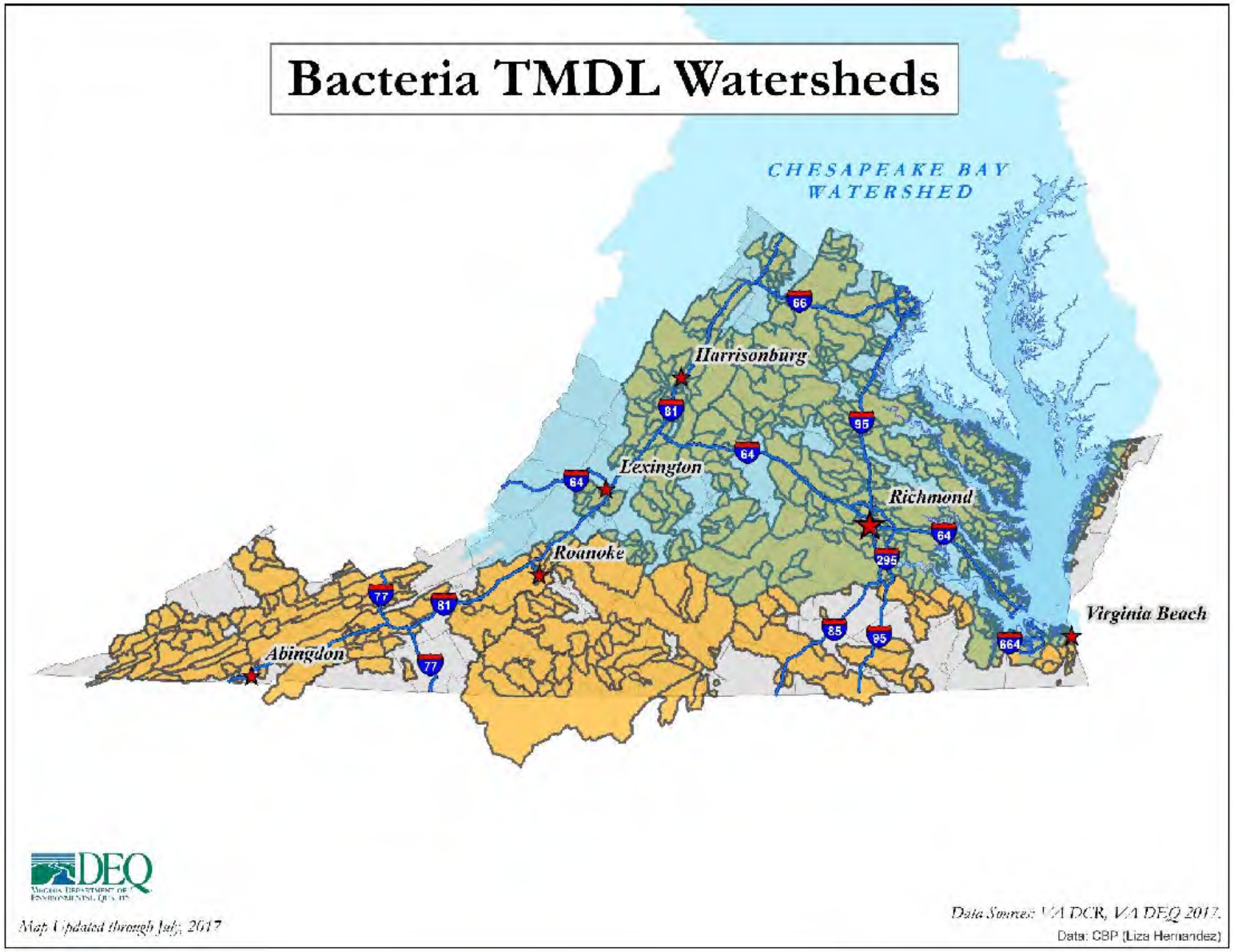
Total Maximum Daily Loads

- When waters are assessed to be impaired for one or more reasons, Total Maximum Daily Loads (TMDLs) and Implementation Plans are developed by DEQ
- TMDLs determine the total amount of a pollutant that a waterbody can receive without exceeding water quality standards
- Implementation Plans identify the management practices that will result in water quality improvements
- http://www.deq.virginia.gov/Programs/Water/WaterQualityInformationTMDLs/TMDL.aspx

The TMDL Process

- Place Impaired Waters on 303(d) List due to Water Quality Standards violations
- Develop TMDL for Impaired Waters:
  - 917 developed through 2016
  - 44% of all impairments still need a TMDL
- Develop TMDL Implementation Plan:
  - 83 projects completed through 2016, addressing 429 impairments
  - 6 more in progress
- As required by the TMDL, update Permit requirements, special conditions, effluent limitations, and/or monitoring requirements
- Remove Waters from 303(d) List when Water Quality Standards achieved


Local TMDL Watersheds
CHESAPEAKE BAY WATERSHED
Harrisonburg
Lexington
Roanoke
Richmond
Virginia Beach
Abingdon
81
64
77
95
295
85
664
DEQ
Data Sources: VA DCR, VA DEQ 2017.
Map Updated through July, 2017.
Data: CBP (Liza Hernandez)


Bacteria TMDL Watersheds
CHESAPEAKE BAY WATERSHED
Harrisonburg
Lexington
Roanoke
Abingdon
Richmond
Virginia Beach
66
81
64
77
95
295
85
664
DEQ
Map Updated through July 2017
Data Sources: VA DCR, VA DEQ 2013.
Data: CBP (Liza Hernandez)

Nutrient and Sediment TMDL Watersheds

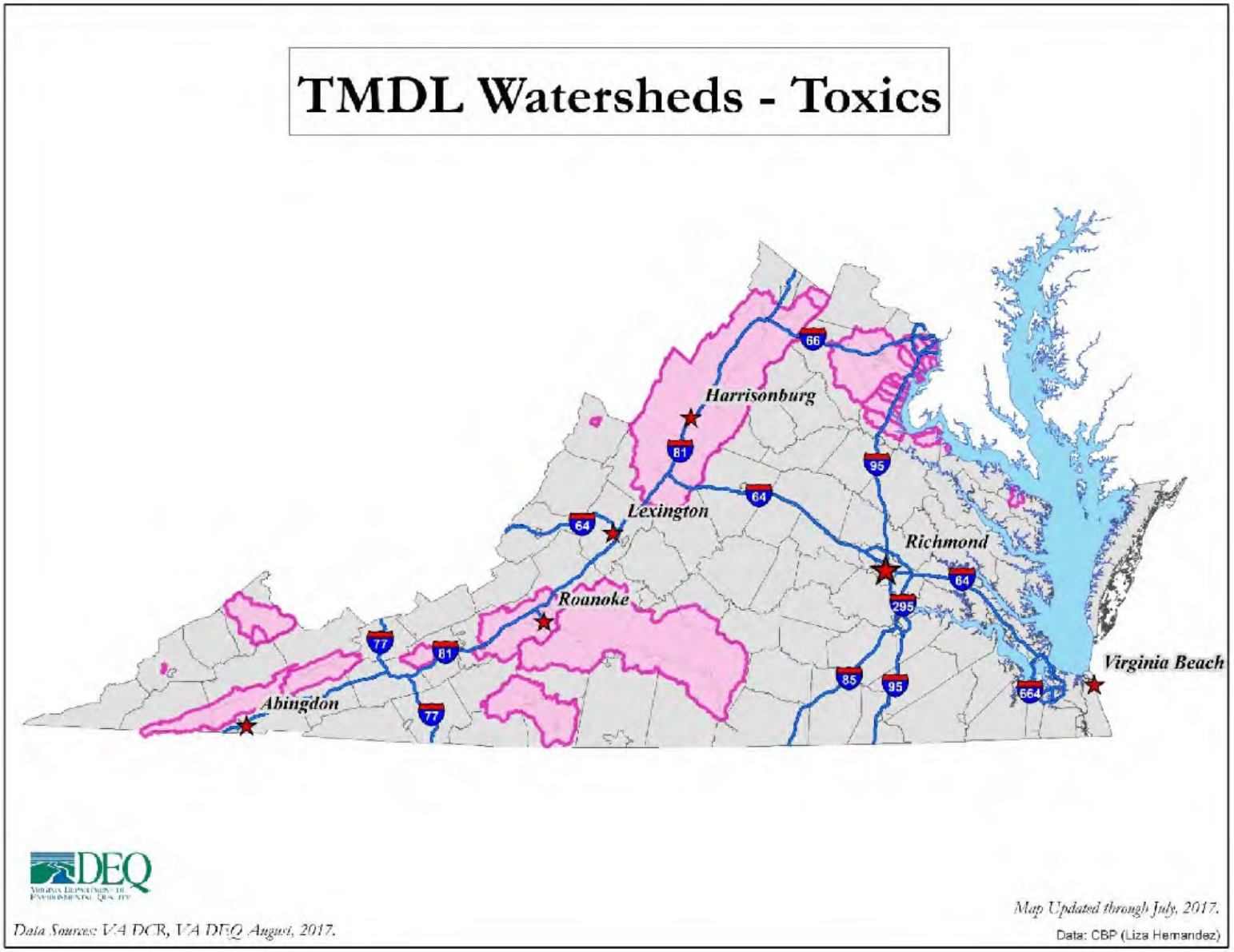
Includes Chesapeake Bay Nutrient and Sediment TMDL Watersheds

DEQ

Data Sources: VA DCR, VA DEQ August, 2017.

Map Updated through July, 2017.

Data: CBP (Liza Hernandez)


TMDL Watersheds - Toxics
Harrisonburg
Lexington
Roanoke
Abingdon
Richmond
Virginia Beach
66
81
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DEQ
Data Sources: VA DCR, VA DEQ August, 2017.
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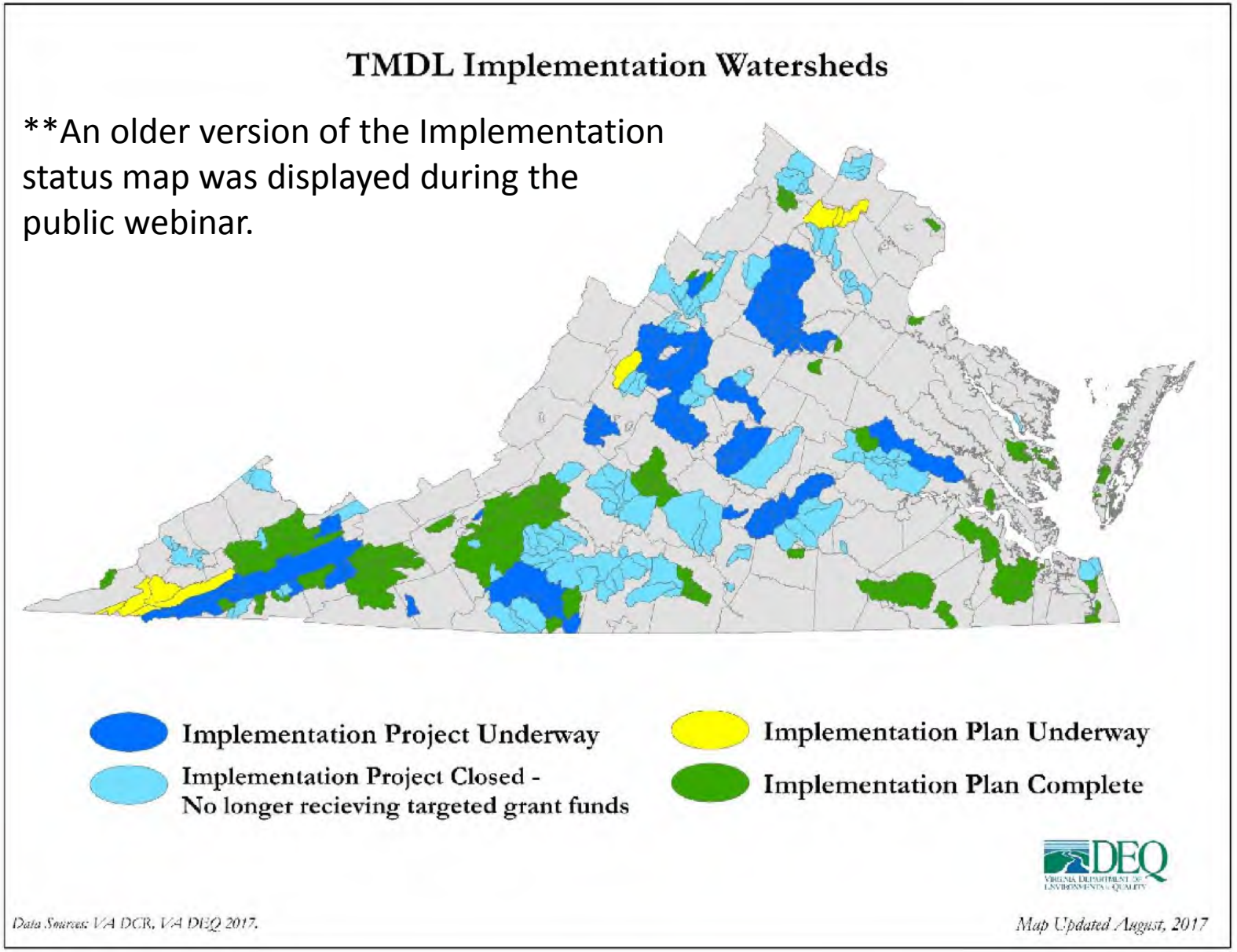

TMDL Implementation Watersheds
**An older version of the Implementation status map was displayed during the public webinar.
Implementation Project Underway
Implementation Project Closed - No longer recieving targeted grant funds
Implementation Plan Underway
Implementation Plan Complete
DEQ
Data Sources: VA DCR, VA DEQ 2017.
Map Updated August, 2017

Water Quality Restoration Progress

Delisted Waters: 2002 - 2016

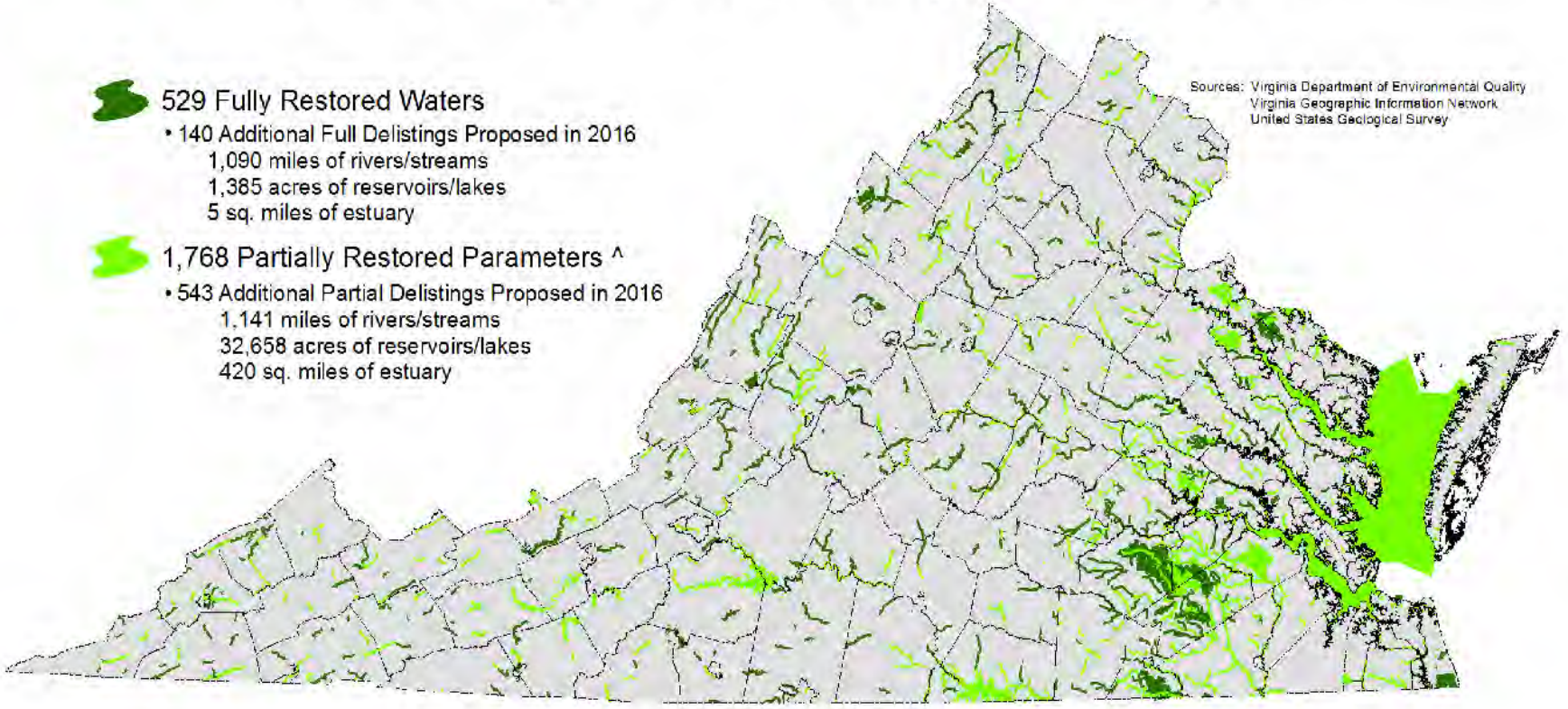
Running total of 529 Fully Restored Waters

- 140 additional Full Delistings submitted in 2016 IR
  - 1,090 miles of Rivers
  - 1,385 acres of Lakes
  - 5 square miles of Estuaries

Running total of 1,768 Partially Restored Waters

- 543 additional Partial Delistings submitted in 2016 IR
  - 1,141 miles of Rivers
  - 32,658 acres of Lakes
  - 420 square miles of Estuaries

Water Quality Restoration Progress* in Virginia



* Restoration progress (i.e. Delist status) is cumulative thru December 2014.

^ Partial delisting totals are parameter based but include over 700 water bodies.

43 delisted Part 2 water permits are not included in the numbers above.

draft; clb 082217

Update on Shenandoah River algae

2014 IR Action: Listing 5 river segments in the 2014 IR (~25 river miles) as having an *observed effect*, but with insufficient data to determine whether or not the recreation use was supported

EPA – DEQ commitments

- Conduct follow-up monitoring during the 2016 and 2017 growing seasons to develop field methods for estimating the percent coverage of river bottom by filamentous algae, and
- Develop impairment thresholds to be included in the 2018 IR Guidance, and
- Make a recreational use attainment decision in the 2018 IR

Update on Shenandoah River algae

Next Steps: Fall 2017, public webinar to present updated findings and recommendations to public (prior to publication of 2018 IR Guidance)

http://www.deq.virginia.gov/Programs/Water/WaterQualityInformationTMDLs/WaterQualityAssessments/ShenandoahAlgae.aspx

2016 IR Public Comment

- Public comment period: **August 7 – September 6, 2017**
- Download Integrated Report via DEQ website: http://www.deq.virginia.gov/Programs/Water/WaterQualityInformationTMDLs/WaterQualityAssessments/2016305b303dIntegratedReport.aspx
- Mapping application: http://www.deq.virginia.gov/ConnectWithDEQ/VEGIS.aspx
- Send comments to:

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